

SERVICE MANUAL



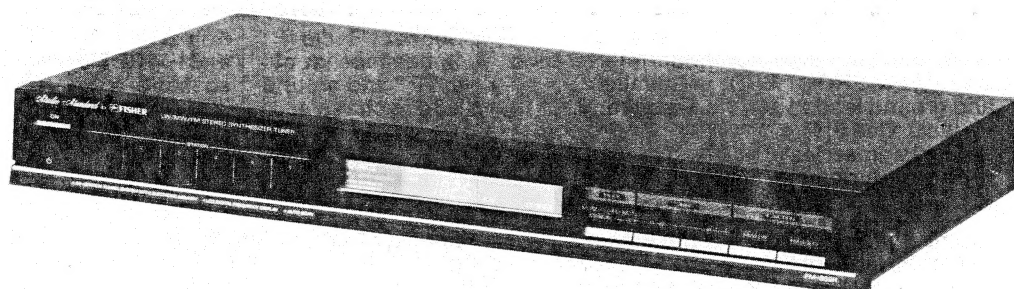
FISHER

LW/MW/FM STEREO SYNTHESIZER TUNER

FM-869R/869

(EUROPE)

This photo is for the model FM-869R.



125 964 41 (FM-869R)
125 964 40 (FM-869)

SPECIFICATIONS

FM SECTION

Usable Sensitivity	
Mono	3.0 μ V/14.73 dBf
Stereo	8.0 μ V/23.26 dBf
50 dB Quieting Sensitivity	
Mono	5.0 μ V/19.19 dBf
Stereo	70.0 μ V/42.10 dBf
Signal-to-Noise Ratio	
Mono	70 dB
Stereo	65 dB
Capture Ratio	1.5 dB
Alt. Channel Selectivity (\pm 400 kHz)	55 dB
Image Response Ratio	46 dB
Spurious Response Ratio	80 dB
IF Response Ratio	90 dB
AM Suppression Ratio	50 dB
Total Harmonic Distortion at 50 dB Quieting	
Mono	0.4 %
Stereo	0.5 %
Total Harmonic Distortion at 65 dBf	
Mono (100 Hz/1 kHz/6 kHz)	0.3/0.3/0.4 %
Stereo (100 Hz/1 kHz/6 kHz)	0.5/0.4/0.5 %

Stereo Separation	
(100 Hz/1 kHz/10 kHz)	40/45/30 dB
Sub-Carrier Rejection (19 kHz/38 kHz)	60/75 dB
Audio Frequency Response	
(20 Hz – 15 kHz)	\pm 3.0 dB

MW SECTION

Usable Sensitivity	600 μ V/m
Selectivity	40 dB
Signal-to-Noise Ratio	55 dB
Image Response Ratio	40 dB
IF Response Ratio	60 dB

LW SECTION

Usable Sensitivity	2500 μ V/m
Selectivity	35 dB
Signal-to-Noise Ratio	48 dB
Image Response Ratio	35 dB
IF Response Ratio	45 dB

GENERAL

Power Requirements (50 Hz)	110/220V AC 12 Watts
Dimensions (W x H x D)	440 x 57 x 280 mm
Weight (approx.)	2.1 kg

— Specifications and design are subject to change without notice.—

REFERENCE No. WM-19681

CAUTION ON RF ADJUSTMENT

This model uses a microprocessor for memory preset control for the various bands. This function has been used to preset frequency points for the different bands to permit adjustment and make it possible to check the function of the microprocessor. To use this supplemental function, ground initialize test point TP6 for 1 second before beginning adjustment. The following table shows the initially preset frequencies.

Band	Memory					
	1	2	3	4	5	6
FM-1	87.5MHz	108MHz	88MHz	98MHz	108MHz	90MHz
MW/LW	603kHz	1404kHz	999kHz	160kHz	350kHz	250kHz

FM TUNER ALIGNMENT

FM ALIGNMENT – FUNCTION switch to FM ST/MUTE position.

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
1. FM IF S-CURVE ALIGNMENT	Connect 10.7MHz Radio IF Genescope output to 8 Pin of FM FRONT END and ground lead to chassis. Use 5pF capacitor in series with generator output lead.	Position of non-interference Minimum Frequency.	Connect Radio IF Genescope input to TP3 and ground lead to chassis.	Adjust FM DET 1st Coil (L102) and FM DET 2nd Coil (L103) so that S-wave form becomes symmetrical.
2. DETECTOR ADJUSTMENT (MINIMUM T.H.D.)	Connect FM RF signal generator thruout FM Dummy Antenna to FM Antenna terminals. Set generator output level to 60dB μ V at 98MHz \pm 2kHz.	Set Preset STATION button to "4" position. Set to 98MHz.	Connect DC Volt-meter across TP8 and TP7.	Adjust FM DET 1st Coil (L102) until DC Voltmeter reads 0V \pm 50mV.
			Harmonic Distortion Analzyer to TUNER OUT.	Adjust FM DET 2nd Coil (L103) for minimum gain and best linearity.
Note: Repeat Step 1 (FM DET 1st Coil L102) and 2 (FM DET 2nd Coil L103) until optimum alignment is reached.				
3. FM MUTING LEVEL ADJUSTMENT	Same as above. Adjust attenuator output level for 50dB μ V.	Same as above.	Scope vertical Input to TUNER OUT.	Set MODE Switch to ST/MUTE. Adjust VR101 until the received wave form becomes half of the maximum form.
Note: Decrease the output level of ATT and confirm that the wave form disappears. Increase the output level of ATT again and confirm that the input level meets the specifications sufficiently when the wave form has appeared.				
4. SIGNAL LED METER ADJUSTMENT	Same as above.	Same as above.	Front Panel SIGNAL STRENGTH LED Display.	Adjust VR102 until the fifth signal LED partly lights up.
5. FM STEREO SIGNAL SEPARATION CONTROL	Connect FM Stereo SG to FM Antenna terminals. 19kHz signal ON. Main channel, sub channel signal ON. Apply 1000Hz signal from LEFT channel.		Connect AC VTVM and Oscilloscope to Right channel TUNER OUT.	Adjust VR301 for minimum output.
	Same as above for RIGHT channel.		Connect AC VTVM and Oscilloscope to Left channel TUNER OUT.	

Use a screwdriver with plastic grip for all adjustments.

**MW/LW Frequency Cover Range
Tuning Voltage Value at TP1**

(Table 1)

	153kHz	360kHz	522kHz	1611kHz
Minimum	1.0V	7.0V	0.8V	7.0V
Maximum	1.5V	9.0V	1.4V	9.0V

AM TUNER ALIGNMENT

AM ALIGNMENT – FUNCTION switch to MW or LW position.
Maintain generator output as low as possible for suitable indication.

Note:
 Perform this alignment after
 FM Tuner Alignment.

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
1. AM IF ALIGNMENT	Connect 450kHz Radio IF Genescope output to Pin 1 and 2 Adjust output level to 70dB μ V.	Position of non-interference Minimum Frequency.	Connect Radio IF Genescope input to TP9 and ground lead to chassis.	Adjust AM IFT (L205) for maximum gain and best symmetry. Keep signal low enough for noise on response.
2. MW RF FREQUENCY COVER ALIGNMENT (1611kHz)	Do not connect generator.	Front Panel DIGITAL Counter Display Set to 1611 kHz.	Connect DC Voltmeter to TP1 and ground lead to chassis.	Check DC Voltmeter for Indication 7.0 ~ 9.0V.
3. (522kHz)	Same as above.	DIGITAL Counter Display Set to 522kHz.	Same as above.	Check DC Voltmeter for Indication 0.8 ~ 1.4V.
Note: Repeat the adjustments in Items 2 and 3. Then, confirm that each voltage becomes 0.8V to 9.0V at receiving frequency of 522kHz to 1611 kHz. (See Table 1)				
4. LW RF FREQUENCY COVER ALIGNMENT (360kHz)	Do not connect generator.	Front Panel DIGITAL Counter Display Set to 360kHz.	Connect DC Voltmeter to TP1 and ground lead to chassis.	Check DC Voltmeter for Indication 7.0 ~ 9.0V.
5. (153kHz)	Same as above.	DIGITAL Counter Display Set to 153kHz.	Same as above.	Check DC Voltmeter for Indication 1.0 ~ 1.5V.
Note: Repeat the adjustments in Items 4 and 5. Then, confirm that each voltage becomes 1.0V to 9.0V at receiving frequency of 153kHz to 360kHz. (See Table 1)				
6. MW RF TRACKING ALIGNMENT (603kHz)	Connect Standard Loop Antenna to output terminal of AM RF Signal Generator. Place Loop Antenna 60cm away from Loop antenna (Unit). Generator Setting to 603kHz or 1404kHz. Modulate with 1kHz (30 % modulation).	Set Preset STATION button to "1" position. Set to 603kHz.	Connect AC VTVM and Oscilloscope to TUNER OUT.	Adjust MW ANT Coil (L201) for maximum gain output.
7. (1404kHz)		Change Preset STATION button to "2" position. Set to 1404kHz.	Same as above.	Adjust MW ANT Trimmer (TC201) for maximum gain output.
Note: Repeat the adjustments in Items 6 and 7. Then, confirm there is no tracking error.				
8. LW RF TRACKING ALIGNMENT (160kHz)	Change generator setting to 160kHz.	Set Preset STATION button to "4" position. Set to 160kHz.	Connect AC VTVM and Oscilloscope to TUNER OUT.	Adjust LW ANT Coil (L202) for maximum gain output.
9. (350kHz)	Change generator setting to 350kHz.	Change Preset STATION button to "5" position. Set to 350kHz.	Same as above.	Adjust LW ANT Trimmer (TC202) for maximum gain output.
Note: Repeat the adjustments in Items 8 and 9. Then, confirm there is no tracking error.				
10. AM AUTO STOP SENSITIVITY ADJUSTMENT	Change generator setting to 999kHz and output level to 60dB μ V/m.	Set Preset STATION button to "3" position. Set to 999kHz.	Front Panel TUNED Indicator Display.	Adjust VR201 until the TUNED Indicator partly light up.

Use a screwdriver with plastic grip for all adjustments.

CABINET & CHASSIS PARTS LIST/EXPLODED VIEW

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol \triangle in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with \triangle , use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual.

Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

Ref. No.	Part No.	Description	Q'ty
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PACKAGE

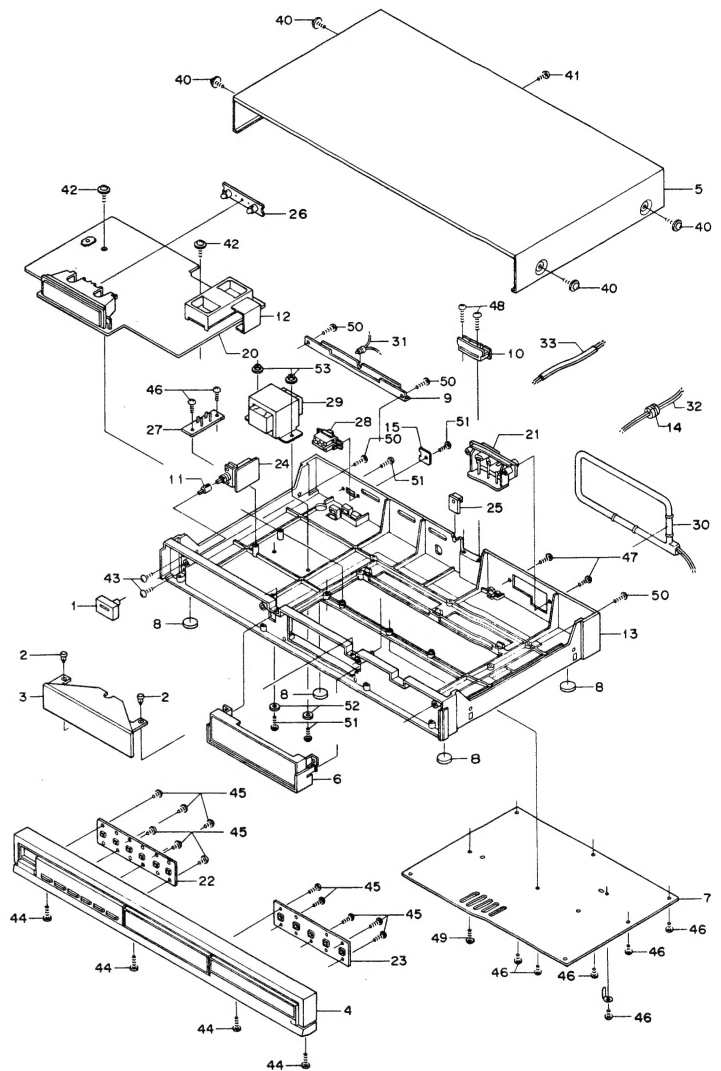
131-6-1169-16836	Box Corrugate-Exp. (FM-869R)	1
131-6-1169-16835	Box Corrugate-Exp. (FM-869)	1
131-6-3009-35610	Pad Right	1
131-6-3009-35620	Pad Left	1
131-6-3069-16350	Patching Sheet	1
141-6-4559-03300	Serial No. Sheet	2
131-6-4559-11200	Serial No. Sheet	2
141-6-2519-10019	Poly Cover 100 X 190	1
141-6-2519-22290	Sheet Polyethylene	1

ACCESSORIES

131-0-4012-00180	FM Antenna Assy	1
131-6-2719-10401	Bag Fan	1
141-2-1729-00500	Holder Antenna	1
142-6-4119-33424	Explanatory Booklet (FM-869R)	1
142-6-4119-33423	Explanatory Booklet (FM-869)	1

CABINET & CHASSIS

1	4-2352-02335	Connector 5P Assy [PC503] (FM-869R only)	1
2	4-2379-21520	Terminal Lug	1
3	131-6-4559-11200	Serial No. Sheet	1
4	141-2-1419-25517	Rating Plate (FM-869R)	1
	141-2-1419-25516	Rating Plate (FM-869)	1
	141-2-4729-07100	Wire Band	7
	131-2-1601-93302	Knob Power	1
	131-2-4221-00600	Rivet	2
	131-2-6308-23504	Filter (Clear)	1
	141-0-1129-25210	Cabinet Front Assy (FM-869R)	1
	141-0-1619-36600	Knob Assy (Function)	1
	141-2-1659-75200	Knob Cap	5
	141-2-2629-10100	Holder Knob	1
	141-2-1129-51801	Cabinet Front	1
	141-2-1319-52500	Window	1
	141-2-1449-61296	Plate Front	1
	141-2-1449-75801	Plate Decorate	1
	141-2-1659-77600	Knob (Tact SW)	1
	411 020 5706	SCR S-TPG BRZ 2.6X8	3
	141-0-1129-25209	Cabinet Front Assy (FM-869)	1
	141-0-1619-36600	Knob Assy (Function)	1
	141-2-1659-75200	Knob Cap	5
	141-2-2629-10100	Holder Knob	1
	141-2-1129-51801	Cabinet Front	1
	141-2-1319-52500	Window	1
	141-2-1449-61286	Plate Front	1
	141-2-1449-75801	Plate Decorate	1
	141-2-1659-77600	Knob (Tact SW)	1
	411 020 5706	SCR S-TPG BRZ 2.6X8	3
5	141-2-1119-93300	Cover	1
6	141-0-1149-17300	Mount Screen Assy	1
	131-2-6308-23603	Filter	1
	141-2-1149-55400	Mount Screen	1
7	131-2-1410-35600	Cover Bottom	1
8	131-2-1801-16200	Leg	4
9	131-2-3310-18500	Metal Mount Lamp	1
10	131-2-3608-16900	Cramp Wire	1
11	131-2-4219-17100	Shaft	1



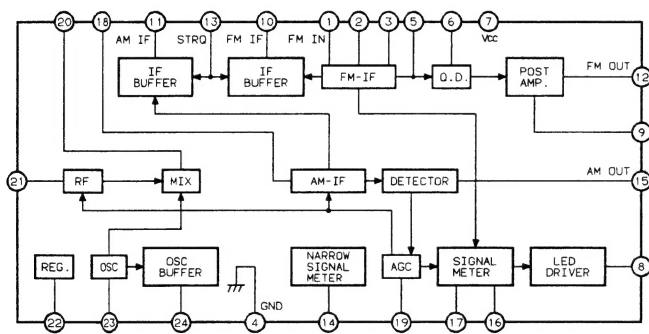
Ref. No.	Part No.	Description	Q'ty
12	131-2-6103-24400	Cover Shield	1
13	141-2-3119-30004	Chassis Cabinet (FM-869R)	1
13	141-2-3119-30003	Chassis Cabinet (FM-869)	1
14	131-2-6111-14200	Bushing (4N-4)	1
15	131-2-7104-00500	Plate Pad Switch	1
20	141-0-1939-21043	Tuner P.C.B. Assy (FM-869R)	1
20	141-0-1939-21044	Tuner P.C.B. Assy (FM-869)	1
21	141-0-1939-21051	Antenna P.C.B. Assy	1
22	141-0-1939-21060	Memory SW. P.C.B. Assy	1
23	141-0-1939-21070	Band SW. P.C.B. Assy	1
24	141-0-1939-21080	Power SW. P.C.B. Assy	1
25	141-0-1939-21090	Top Cover E.M.P.C.B. Assy	1

CABINET & CHASSIS PARTS LIST

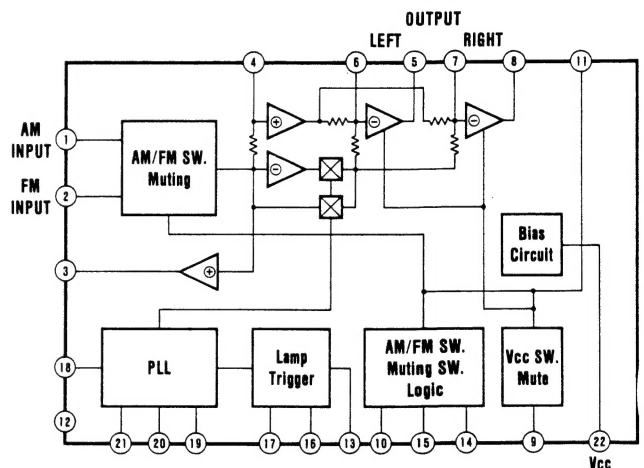
Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
26	141-0-1939-21100	Lamp P.C.B. Assy	1	46	411 020 8004	SCR S-TPG BRZ 3X8	8
27	141-0-1939-21120	EC Terminal P.C.B. Assy	1	47	411 099 9506	SCR S-TPG BRZ 3X10	2
28	△ 4-2312-02650	Switch Slide (AC Selector) [S713]	1	48	411 020 6208	SCR S-TPG BRZ 3X12	2
29	△ 4-2512-35320	Power Trans	1	49	411 020 6604	SCR S-TPG BRZ 3X14	1
30	4-2579-71601	Loop Antenna	1	50	411 020 7007	SCR S-TPG BRZ 3X20	4
31	4-6129-70712	Lamp	1	51	411 040 6400	SCR PAN 3X10	4
32	4-2369-74591	Plug Cord RCA (Output)	1	52	411 092 9503	WASHER Z 3.2X8X1	2
33	△ 4-2432-00502	Power Cord	1	53	131-2-4202-12903	Flange Nut M3X8 Z	2
40	141-2-4219-38400	+BTS-B 4X8 Sems BLK	4	NOTES: 1. Parts order must contain Model Number, Part Number and Description. 2. Ordering quantity of screws and resistors must be multiple of 10 pcs.			
41	131-2-4201-25303	+BRTS-B 3X10 BL Sems	1				
42	131-2-4201-25201	+BRTS-B Sems 3X8 Z	2				
43	411 002 8503	SCR PAN 3X6	2				
44	411 021 3206	SCR S-TPG BIN 2.6X8	4				
45	411 020 5508	SCR S-TPG BRZ 2.6X6	11				

INTEGRATED CIRCUIT BLOCK DIAGRAM

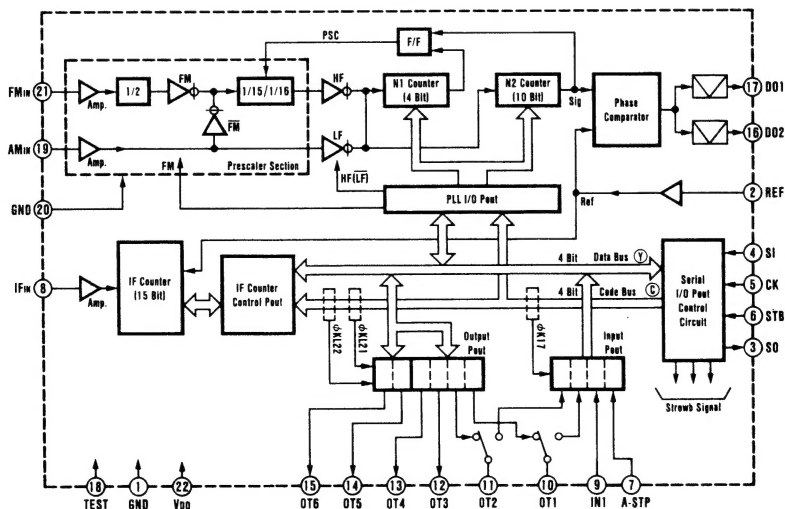
AM RF IF/FM IF IC LA 1266



FM MPX AM/FM SWITCH IC LA 3400



PRESCALER AND PLL CONTROL IC TC 9171P



P.C.BOARD PARTS LIST

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
TUNER P.C.B. ASSY				D511	407 005 3805	DIODE DS442-BT	1
20	141-0-1939-21043	Tuner P.C.B. Assy	1	D513	407 061 2200	DIODE 1SS254-TA	1
	4-1259-72066	FM Front END	1	D513	407 008 0405	DIODE GMB01-BT	1
	(Component parts used in Front End are not serviceable and available.)			D514	407 005 3805	DIODE DS442-BT	1
	4-2359-79038	Connector 1P Assy	2	D515	407 012 8503	DIODE 1SS53	1
	4-9549-70090	LCD, FTD6410	1	D517	407 061 2200	DIODE 1SS254-TA	1
	111-2-6220-11100	Wire Wrap Terminal	15	or	407 008 0405	DIODE GMB01-BT	1
	131-2-6201-33600	Plate Heat Sink (for IC401)	1	D519	407 061 2200	DIODE 1SS254-TA	1
	131-2-6306-12400	Reflector	1	or	407 008 0405	DIODE GMB01-BT	1
	131-2-6308-25500	Filter	1	D801	407 049 8101	ZENER DIODE GZA2.0X	1
	141-2-3229-60200	Plate Earth	1	C201	407 000 4708	VARACTOR DI SVC321C-2	1
	411 020 8004	SCR S-TPG BRZ 3X8	1	R536	407 005 3805	DIODE DS442-BT	1
PC503	4-2369-73150	Plug 5P	1	IC101	409 073 9505	IC LA1266	1
CF101	4-2279-70190	Ceramic Filter 10.7MHz	1	IC301	409 017 0803	IC LA3400	1
CF102	4-2272-00301	Ceramic Filter 10.7MHz	1	IC401	409 074 0808	IC LA5667	1
CF201	4-2272-00230	Ceramic Filter 450kHz	1	IC501	410 014 9607	IC TSE2039AF-020	1
CF301	4-2279-70080	Ceramic OSC	1	IC502	409 072 1005	IC TC9171P	1
CF501	4-2259-71060	Crystal 7.2MHz	1	Q101	405 011 7503	TR 2SC1740-S	1
F401	△ 4-2349-70620	Protector ICP-5 (0.25A)	1	Q103	405 004 5004	TR 2SA608-G-NP	1
L101A	4-2529-70510	Filter 1st	1	Q104	405 019 3804	TR 2SC536-G-NP	1
L101B	4-2529-70511	Filter 2nd	1	or	405 011 7503	TR 2SC1740-S	1
L102	4-2569-72220	IFT, FM DET 1st	1	Q201	405 027 0505	TR 2SK246-GR	1
L103	4-2569-72230	IFT, FM DET 2nd	1	or	405 034 6002	TR 2SK381-D	1
L104	4-2529-70231	Anti Birdie Filter	1	Q202	405 021 0808	TR 2SD1012-H	1
L201	4-2579-71730	MW ANT Coil	1	Q203	405 019 3804	TR 2SC536-G-NP	1
L202	4-2579-71740	LW ANT Coil	1	or	405 011 7503	TR 2SC1740-S	1
L203	4-2589-72476	MW OSC Coil	1	Q204	405 019 3804	TR 2SC536-G-NP	1
L204	4-2589-72486	LW OSC Coil	1	or	405 011 7503	TR 2SC1740-S	1
L205	4-2569-72031	AM IFT	1	Q205	405 019 3804	TR 2SC536-G-NP	1
L301	4-2529-70330	LP Filter	1	or	405 011 7503	TR 2SC1740-S	1
L302	4-2529-70330	LP Filter	1	Q206	405 004 5004	TR 2SA608-G-NP	1
L303	4-2539-71420	Choke Coil (100μH)	1	Q207	405 004 3901	TR 2SA608-E-NP	1
L304	4-2539-71420	Choke Coil (100μH)	1	Q208	405 019 3804	TR 2SC536-G-NP	1
L501	4-2539-71350	Choke Coil (1mH)	1	or	405 011 7503	TR 2SC1740-S	1
TC201	4-2249-70581	Trimmer Condenser	1	Q209	405 011 7107	TR 2SC1740-E	1
TC202	4-2249-71160	Trimmer 20PF	1	Q301	405 019 3804	TR 2SC536-G-NP	1
VR101	4-2229-76560	Potentiometer (B-100kΩ)	1	or	405 011 7503	TR 2SC1740-S	1
VR102	4-2229-76561	Potentiometer (B-10kΩ)	1	Q401	405 004 3901	TR 2SA608-E-NP	1
VR201	4-2229-76562	Potentiometer (B-20kΩ)	1	Q402	405 021 0808	TR 2SD1012-H	1
VR301	4-2229-76560	Potentiometer (B-100kΩ)	1	Q403	405 021 0808	TR 2SD1012-H	1
If necessary, replace both Diode D202, C201 (SVC 321) together with new ones which have the equivalent characteristics.				Q501	405 004 5004	TR 2SA608-G-NP	1
D101	407 005 3805	DIODE DS442-BT	1	Q502	405 004 5004	TR 2SA608-G-NP	1
D202	407 000 4708	VARACTOR DI SVC321C-2	1	Q503	405 004 5004	TR 2SA608-G-NP	1
D203	407 061 2200	DIODE 1SS254-TA	1	Q504	405 004 5004	TR 2SA608-G-NP	1
or	407 008 0405	DIODE GMB01-BT	1	Q505	405 004 5004	TR 2SA608-G-NP	1
D204	407 061 2200	DIODE 1SS254-TA	1	Q506	405 027 0604	TR 2SK246-Y	1
or	407 008 0405	DIODE GMB01-BT	1	or	405 034 5906	TR 2SK381-C	1
D205	407 005 3805	DIODE DS442-BT	1	Q507	405 011 7107	TR 2SC1740-E	1
D401	407 005 2105	DIODE DS135D-KB3	1	or	405 012 1807	TR 2SC1815-BL	1
D402	407 005 2105	DIODE DS135D-KB3	1	C102	403 069 8404	CERAMIC 0.01U Z 50V	1
D403	407 005 2105	DIODE DS135D-KB3	1	C104	403 047 1502	ELECT 4.7U M 25V	1
D404	407 005 2105	DIODE DS135D-KB3	1	C105	403 074 2701	CERAMIC 0.047U Z 50V	1
D501	407 005 3805	DIODE DS442-BT	1	C106	403 069 8404	CERAMIC 0.01U Z 50V	1
D505	407 005 3805	DIODE DS442-BT	1	C107	403 044 0201	ELECT 47U M 16V	1
D507	407 061 2200	DIODE 1SS254-TA	1	C110	403 074 2701	CERAMIC 0.047U Z 50V	1
or	407 008 0405	DIODE GMB01-BT	1	C111	403 074 2701	CERAMIC 0.047U Z 50V	1
D508	407 061 2200	DIODE 1SS254-TA	1	C112	403 042 3501	ELECT 100U M 16V	1
or	407 005 3805	DIODE DS442-BT	1	C113	403 069 8404	CERAMIC 0.01U Z 50V	1
or	407 008 0405	DIODE GMB01-BT	1	C114	403 069 8404	CERAMIC 0.01U Z 50V	1
D510	407 005 3805	DIODE DS442-BT	1	C115	403 049 1609	ELECT 1U M 50V	1
				C116	403 075 4308	CERAMIC 820P K 50V	1
				C117	403 039 2906	ELECT 47U M 6.3V	1
				C118	403 074 6501	CERAMIC 560P K 50V	1
				C119	403 073 6502	CERAMIC 470P K 50V	1
				C120	403 069 8404	CERAMIC 0.01U Z 50V	1
				C121	403 038 2303	ELECT 100U M 6.3V	1

P.C.BOARD PARTS LIST(Continued)

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
C122	403 049 1609	ELECT 1U M 50V	1	C519	403 069 8404	CERAMIC 0.01U Z 50V	1
C123	403 069 8404	CERAMIC 0.01U Z 50V	1	C520	403 038 2303	ELECT 100U M 6.3V	1
C124	403 049 1609	ELECT 1U M 50V	1	C521	403 069 0705	CERAMIC 1000P K 50V	1
C126	403 069 8404	CERAMIC 0.01U Z 50V	1	C522	403 049 1609	ELECT 1U M 50V	1
C127	403 014 6202	CERAMIC 18P K 50V	1	C523	403 038 2303	ELECT 100U M 6.3V	1
C202	403 026 9406	CERAMIC 5P C 50V	1	C524	403 042 3501	ELECT 100U M 16V	1
C203	403 026 5408	CERAMIC 47P K 50V	1	C531	403 049 1609	ELECT 1U M 50V	1
C204	403 074 2701	CERAMIC 0.047U Z 50V	1	C533	403 069 8404	CERAMIC 0.01U Z 50V	1
C205	403 074 2701	CERAMIC 0.047U Z 50V	1	C534	403 069 8404	CERAMIC 0.01U Z 50V	1
C206	403 074 2701	CERAMIC 0.047U Z 50V	1	C535	403 069 8404	CERAMIC 0.01U Z 50V	1
C207	403 074 2701	CERAMIC 0.047U Z 50V	1	CF202	403 069 8404	CERAMIC 0.01U Z 50V	1
C208	403 050 1209	ELECT 2.2U M 50V	1	D201	403 074 2701	CERAMIC 0.047U Z 50V	1
C209	403 031 0306	CERAMIC 68P K 50V	1	R101	401 012 4107	CARBON 100 JA 1/4W	1
C210	403 088 4104	STYRENE 430P J 50V	1	R102	401 024 7707	CARBON 100K JA 1/6W	1
C211	403 014 6202	CERAMIC 18P K 50V	1	R103	401 022 4104	CARBON 68K JA 1/4W	1
C212	403 069 8404	CERAMIC 0.01U Z 50V	1	R104	401 024 7400	CARBON 10K JA 1/6W	1
C213	403 088 1103	STYRENE 330P J 50V	1	R105	401 019 9204	CARBON 47 JA 1/4W	1
C214	403 074 2701	CERAMIC 0.047U Z 50V	1	R107	401 026 4308	CARBON 3.3K JA 1/6W	1
C215	403 074 2701	CERAMIC 0.047U Z 50V	1	R110	401 019 9600	CARBON 47 JA 1/4W	1
C216	403 042 0302	ELECT 10U M 16V	1	R111	401 027 5502	CARBON 6.8K JA 1/6W	1
C217	403 026 5408	CERAMIC 47P K 50V	1	R112	401 026 1000	CARBON 2.7K JA 1/6W	1
C218	403 050 7706	ELECT 3.3U M 50V	1	R113	401 026 4308	CARBON 3.3K JA 1/6W	1
C219	403 047 1502	ELECT 4.7U M 25V	1	R114	401 016 3809	CARBON 2.2K JA 1/4W	1
C220	403 047 1502	ELECT 4.7U M 25V	1	R115	401 027 5502	CARBON 6.8K JA 1/6W	1
C221	403 069 8404	CERAMIC 0.01U Z 50V	1	R116	401 016 4806	CARBON 22K JA 1/4W	1
C222	403 003 6701	CERAMIC 0.033U K 25V	1	R117	401 027 0309	CARBON 47K JA 1/6W	1
C223	403 075 0508	CERAMIC 6800P K 50V	1	R118	401 012 8105	CARBON 100K JA 1/4W	1
C224	403 071 7501	CERAMIC 2200P K 50V	1	R119	401 016 1102	CARBON 22 JA 1/4W	1
C301	403 042 0302	ELECT 10U M 16V	1	R120	401 027 0309	CARBON 47K JA 1/6W	1
C302	403 020 6203	CERAMIC 270P K 50V	1	R121	401 026 4308	CARBON 3.3K JA 1/6W	1
C303	403 062 0900	POLYESTER 0.047U K 50V	1	R122	401 012 5708	CARBON 1K JA 1/4W	1
C305	403 042 0302	ELECT 10U M 16V	1	R124	401 024 7707	CARBON 100K JA 1/6W	1
C306	403 048 7602	ELECT 0.47U M 50V	1	R128	401 020 2904	CARBON 47K JA 1/4W	1
C307	403 049 1609	ELECT 1U M 50V	1	R133	401 027 0309	CARBON 47K JA 1/6W	1
C308	403 047 1502	ELECT 4.7U M 25V	1	R201	401 020 3901	CARBON 470K JA 1/4W	1
C309	403 069 8404	CERAMIC 0.01U Z 50V	1	R202	401 024 7004	CARBON 1K JA 1/6W	1
C311	403 020 6203	CERAMIC 270P K 50V	1	R203	401 027 0507	CARBON 470K JA 1/6W	1
C312	403 020 6203	CERAMIC 270P K 50V	1	R204	401 026 6609	CARBON 390 JA 1/6W	1
C313	403 050 1209	ELECT 2.2U M 50V	1	R205	401 026 1000	CARBON 2.7K JA 1/6W	1
C314	403 050 1209	ELECT 2.2U M 50V	1	R206	401 012 4503	CARBON 100 JA 1/4W	1
C315	403 073 8407	CERAMIC 4700P K 50V	1	R207	401 024 7004	CARBON 1K JA 1/6W	1
C316	403 073 8407	CERAMIC 4700P K 50V	1	R208	401 021 3009	CARBON 5.6K JA 1/4W	1
C401	403 074 2701	CERAMIC 0.047U Z 50V	1	R209	401 025 7805	CARBON 2.2K JA 1/6W	1
C402	403 074 2701	CERAMIC 0.047U Z 50V	1	R210	401 020 2003	CARBON 4.7K JA 1/4W	1
C403	403 074 2701	CERAMIC 0.047U Z 50V	1	R211	401 025 8208	CARBON 22K JA 1/6W	1
C404	403 074 2701	CERAMIC 0.047U Z 50V	1	R212	401 016 4806	CARBON 22K JA 1/4W	1
C405	403 045 2808	ELECT 1000U M 25V	1	R213	401 012 5708	CARBON 1K JA 1/4W	1
C406	403 069 8404	CERAMIC 0.01U Z 50V	1	R214	401 024 7707	CARBON 100K JA 1/6W	1
C407	403 042 0302	ELECT 10U M 16V	1	R215	401 025 8208	CARBON 22K JA 1/6W	1
C408	403 040 2704	ELECT 22U M 10V	1	R216	401 026 9907	CARBON 4.7K JA 1/6W	1
C409	403 049 1609	ELECT 1U M 50V	1	R217	401 027 5502	CARBON 6.8K JA 1/6W	1
C501	403 040 6603	ELECT 2200U M 10V	1	R218	401 012 8105	CARBON 100K JA 1/4W	1
C502	403 040 4708	ELECT 220U M 10V	1	R219	401 016 4806	CARBON 22K JA 1/4W	1
C503	403 069 8404	CERAMIC 0.01U Z 50V	1	R220	401 027 2600	CARBON 5.6K JA 1/6W	1
C504	403 019 7303	CERAMIC 27P J 50V	1	R221	401 024 7707	CARBON 100K JA 1/6W	1
C505	403 019 7303	CERAMIC 27P J 50V	1	R222	401 026 9907	CARBON 4.7K JA 1/6W	1
C506	403 049 1609	ELECT 1U M 50V	1	R223	401 025 7102	CARBON 22 JA 1/6W	1
C507	403 026 5408	CERAMIC 47P K 50V	1	R224	401 025 4606	CARBON 18K JA 1/6W	1
C508	403 074 2701	CERAMIC 0.047U Z 50V	1	R225	401 022 3107	CARBON 6.8K JA 1/4W	1
C509	403 026 5408	CERAMIC 47P K 50V	1	R226	401 014 4105	CARBON 1.5K JA 1/4W	1
C510	403 004 9503	CERAMIC 2200P K 50V	1	R227	401 018 3807	CARBON 3.3K JA 1/4W	1
C514	403 026 5408	CERAMIC 47P K 50V	1	R228	401 027 0309	CARBON 47K JA 1/6W	1
C515	403 057 0908	POLYESTER 0.01U K 50V	1	R229	401 012 8105	CARBON 100K JA 1/4W	1
C516	403 002 2902	CERAMIC 0.01U M 25V	1	R230	401 012 5708	CARBON 1K JA 1/4W	1
C517	403 026 5408	CERAMIC 47P K 50V	1	R231	401 012 7009	CARBON 10K JA 1/4W	1
C518	403 069 1504	CERAMIC 1000P K 50V	1	R232	401 024 7400	CARBON 10K JA 1/6W	1

P.C.BOARD PARTS LIST(Continued)

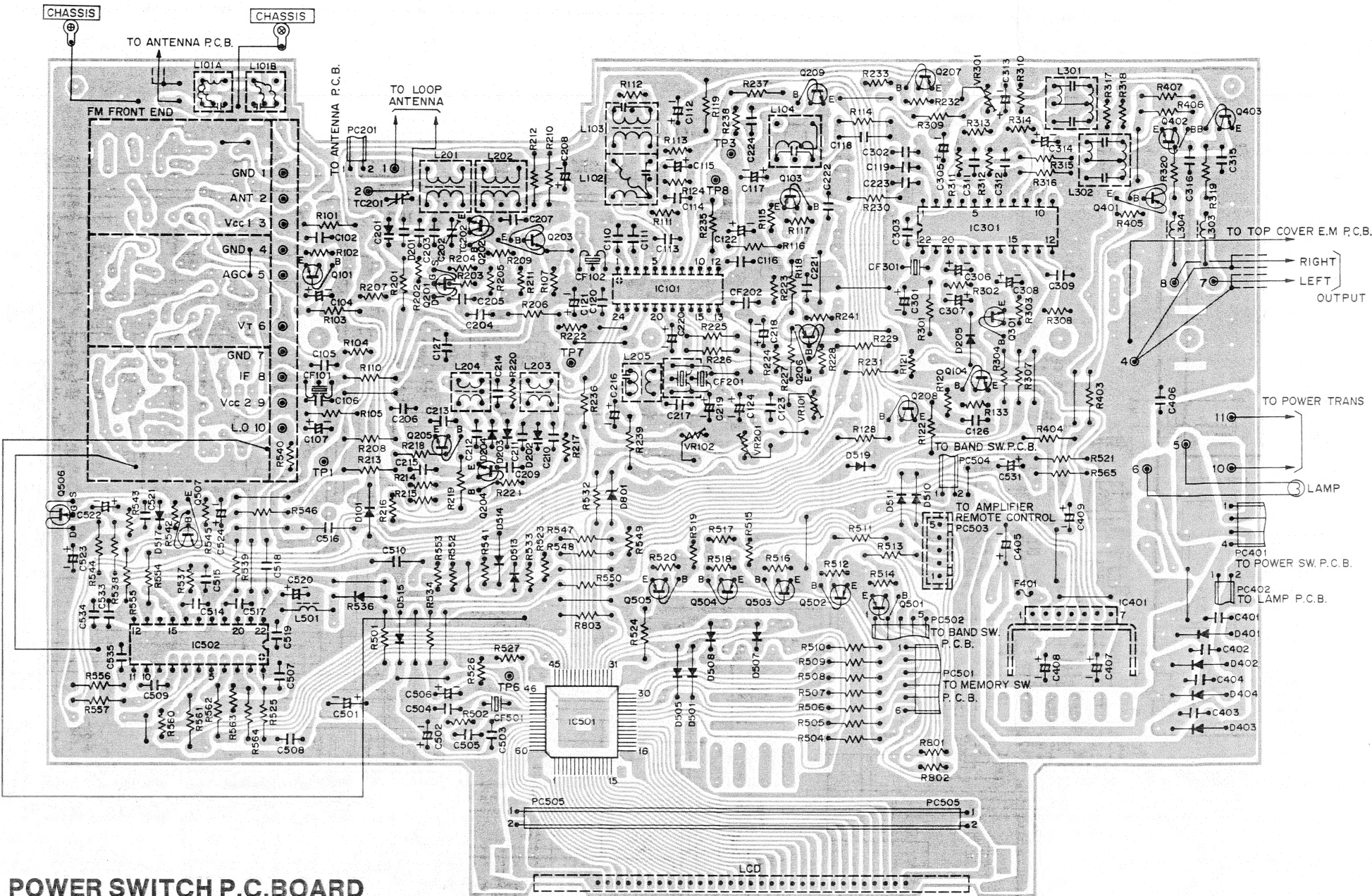
Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
R233	401 024 7400	CARBON 10K JA 1/6W	1	R545	401 024 7400	CARBON 10K JA 1/6W	1
R235	401 016 3809	CARBON 2.2K JA 1/4W	1	R546	401 012 5708	CARBON 1K JA 1/4W	1
R236	401 012 5708	CARBON 1K JA 1/4W	1	R547	401 012 5708	CARBON 1K JA 1/4W	1
R237	401 020 2904	CARBON 47K JA 1/4W	1	R548	401 016 4806	CARBON 22K JA 1/4W	1
R238	401 024 7707	CARBON 100K JA 1/6W	1	R549	401 024 7400	CARBON 10K JA 1/6W	1
R239	401 012 4107	CARBON 100 JA 1/4W	1	R550	401 012 5708	CARBON 1K JA 1/4W	1
R241	401 025 8208	CARBON 22K JA 1/6W	1	R552	401 027 5908	CARBON 68K JA 1/6W	1
R301	401 016 1102	CARBON 22 JA 1/4W	1	R553	401 024 7707	CARBON 100K JA 1/6W	1
R302	401 026 4308	CARBON 3.3K JA 1/6W	1	R554	401 012 5708	CARBON 1K JA 1/4W	1
R303	401 024 7400	CARBON 10K JA 1/6W	1	R555	401 012 5708	CARBON 1K JA 1/4W	1
R304	401 020 2904	CARBON 47K JA 1/4W	1	R556	401 012 5708	CARBON 1K JA 1/4W	1
R307	401 012 5708	CARBON 1K JA 1/4W	1	R557	401 012 5708	CARBON 1K JA 1/4W	1
R308	401 027 5908	CARBON 68K JA 1/6W	1	R560	401 024 7004	CARBON 1K JA 1/6W	1
R309	401 018 3807	CARBON 3.3K JA 1/4W	1	R561	401 012 5708	CARBON 1K JA 1/4W	1
R310	401 024 7400	CARBON 10K JA 1/6W	1	R562	401 012 5708	CARBON 1K JA 1/4W	1
R311	401 025 4903	CARBON 180K JA 1/6W	1	R563	401 024 7400	CARBON 10K JA 1/6W	1
R312	401 025 4903	CARBON 180K JA 1/6W	1	R564	401 024 7004	CARBON 1K JA 1/6W	1
R313	401 025 7805	CARBON 2.2K JA 1/6W	1	R565	401 018 2800	CARBON 330 JA 1/4W	1
R314	401 025 7805	CARBON 2.2K JA 1/6W	1	R801	401 025 7805	CARBON 2.2K JA 1/6W	1
R315	401 014 6109	CARBON 150K JA 1/4W	1	R802	401 025 7805	CARBON 2.2K JA 1/6W	1
R316	401 014 6109	CARBON 150K JA 1/4W	1	R803	401 012 8105	CARBON 100K JA 1/4W	1
R317	401 026 7002	CARBON 3.9K JA 1/6W	1	The following each part is not needed in the FM-869 circuit.			
R318	401 026 7002	CARBON 3.9K JA 1/6W	1	PC503	4-2369-731500	Plug 5P	1
R319	401 012 5708	CARBON 1K JA 1/4W	1	C531	403 049 1609	ELECT 1U M 50V	1
R320	401 012 5708	CARBON 1K JA 1/4W	1	D510	407 005 3805	DIODE DS442-BT	1
R403	401 012 7009	CARBON 10K JA 1/4W	1	D511	407 005 3805	DIODE DS442-BT	1
R404	401 016 4806	CARBON 22K JA 1/4W	1	Q501	405 004 5004	TR 2SA608-G-NP	1
R405	401 024 7400	CARBON 10K JA 1/6W	1	Q502	405 004 5004	TR 2SA608-G-NP	1
R406	401 020 2003	CARBON 4.7K JA 1/4W	1	Q503	405 004 5004	TR 2SA608-G-NP	1
R407	401 020 2003	CARBON 4.7K JA 1/4W	1	Q504	405 004 5004	TR 2SA608-G-NP	1
R501	401 012 4503	CARBON 100 JA 1/4W	1	Q505	405 004 5004	TR 2SA608-G-NP	1
R502	401 027 2600	CARBON 5.6K JA 1/6W	1	R511	401 014 6109	CARBON 150K JA 1/4W	1
R504	401 012 7009	CARBON 10K JA 1/4W	1	R512	401 027 5908	CARBON 68K JA 1/6W	1
R505	401 012 7009	CARBON 10K JA 1/4W	1	R513	401 014 6109	CARBON 150K JA 1/4W	1
R506	401 012 7009	CARBON 10K JA 1/4W	1	R514	401 027 5908	CARBON 68K JA 1/6W	1
R507	401 012 7009	CARBON 10K JA 1/4W	1	R515	401 025 2305	CARBON 150K JA 1/6W	1
R508	401 018 3807	CARBON 3.3K JA 1/4W	1	R516	401 027 5908	CARBON 68K JA 1/6W	1
R509	401 018 3807	CARBON 3.3K JA 1/4W	1	R517	401 025 2305	CARBON 150K JA 1/6W	1
R510	401 018 3807	CARBON 3.3K JA 1/4W	1	R518	401 027 5908	CARBON 68K JA 1/6W	1
R511	401 014 6109	CARBON 150K JA 1/4W	1	R519	401 025 2305	CARBON 150K JA 1/6W	1
R512	401 027 5908	CARBON 68K JA 1/6W	1	R520	401 027 5908	CARBON 68K JA 1/6W	1
R513	401 014 6109	CARBON 150K JA 1/4W	1	R521	401 020 0801	CARBON 470 JA 1/4W	1
R514	401 027 5908	CARBON 68K JA 1/6W	1	R524	401 018 3807	CARBON 3.3K JA 1/4W	1
R515	401 025 2305	CARBON 150K JA 1/6W	1	R565	401 018 2800	CARBON 330 JA 1/4W	1
R516	401 027 5908	CARBON 68K JA 1/6W	1	R801	401 025 7805	CARBON 2.2K JA 1/6W	1
R517	401 025 2305	CARBON 150K JA 1/6W	1	R802	401 025 7805	CARBON 2.2K JA 1/6W	1
R518	401 027 5908	CARBON 68K JA 1/6W	1	ANTENNA P.C.B. ASSY			
R519	401 025 2305	CARBON 150K JA 1/6W	1	21	141-0-1939-21051	Antenna P.C.B. Assy	1
R520	401 027 5908	CARBON 68K JA 1/6W	1		4-2372-01141	Antenna Terminal 3P (Antenna)	1
R521	401 020 0801	CARBON 470 JA 1/4W	1	L701	4-2539-71610	Choke Coil (470μH)	1
R523	401 024 7400	CARBON 10K JA 1/6W	1	C703	403 008 5204	CERAMIC 10P D 50V	1
R524	401 018 3807	CARBON 3.3K JA 1/4W	1	R703	401 018 3807	CARBON 3.3K JA 1/4W	1
R525	401 016 2604	CARBON 220 JA 1/4W	1	MEMORY SW. P.C.B. ASSY			
R526	401 024 7004	CARBON 1K JA 1/6W	1	22	141-0-1939-21060	Memory SW. P.C.B. Assy	1
R527	401 027 8602	CARBON 8.2K JA 1/6W	1	S701	4-2312-05300	Keyboard Switch 6mm (Preset Station 1)	1
R532	401 012 5708	CARBON 1K JA 1/4W	1	S702	4-2312-05300	Keyboard Switch 6mm (Preset Station 2)	1
R533	401 024 7400	CARBON 10K JA 1/6W	1	S703	4-2312-05300	Keyboard Switch 6mm (Preset Station 3)	1
R534	401 012 8105	CARBON 100K JA 1/4W	1	S704	4-2312-05300	Keyboard Switch 6mm (Preset Station 4)	1
R537	401 026 1000	CARBON 2.7K JA 1/6W	1	S705	4-2312-05300	Keyboard Switch 6mm (Preset Station 5)	1
R538	401 017 1804	CARBON 2.7K JA 1/4W	1	S706	4-2312-05300	Keyboard Switch 6mm (Preset Station 6)	1
R539	401 012 5708	CARBON 1K JA 1/4W	1				
R540	401 026 9303	CARBON 47 JA 1/6W	1				
R541	401 027 5908	CARBON 68K JA 1/6W	1				
R542	401 027 5205	CARBON 680 JA 1/6W	1				
R543	401 024 7400	CARBON 10K JA 1/6W	1				
R544	401 020 0801	CARBON 470 JA 1/4W	1				

P.C.BOARD PARTS LIST (Continued)

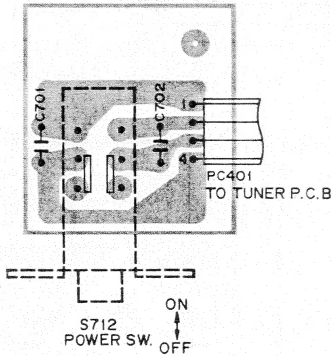
Ref. No.	Part No.	Description	Q'ty
BAND SW. P.C.B. ASSY			
23	141-0-1939-21070	Band SW. P.C.B. Assy	1
S707	4-2312-05300	Keyboard Switch 6mm (FM-1/2/3)	1
S708	4-2312-05300	Keyboard Switch 6mm (MW/LW)	1
S709	4-2312-05300	Keyboard Switch 6mm (Up)	1
S710	4-2312-05300	Keyboard Switch 6mm (Down)	1
S711	4-2312-05300	Keyboard Switch 6mm (Mode)	1
POWER SW. P.C.B. ASSY			
24	141-0-1939-21080	Power SW. P.C.B. Assy	1
S712	4-2319-76831	Switch Push 1 key (Power)	1
C701	403 069 8404	CERAMIC 0.01U Z 50V	1
C702	403 069 8404	CERAMIC 0.01U Z 50V	1
TOP COVER E.M. P.C.B. ASSY			
25	141-0-1939-21090	Top Cover E.M. P.C.B. Assy	1
	141-2-3229-52100	Plate Earth	1
LAMP P.C.B. ASSY			
26	141-0-1939-21100	Lamp P.C.B. Assy	1
	4-6129-70760	Lamp	2
	131-2-4208-35900	Spacer	2
EC TERMINAL P.C.B. ASSY			
27	141-0-1939-21120	EC Terminal P.C.B. Assy	1
	4-2372-00830	EC Terminal 1P	2
	111-2-6220-11100	Wire Wrap Terminal	2

- NOTES:
- Parts order must contain Model Number, Part Number and Description.
 - Ordering quantity of screws and resistors must be multiple of 10 pcs.

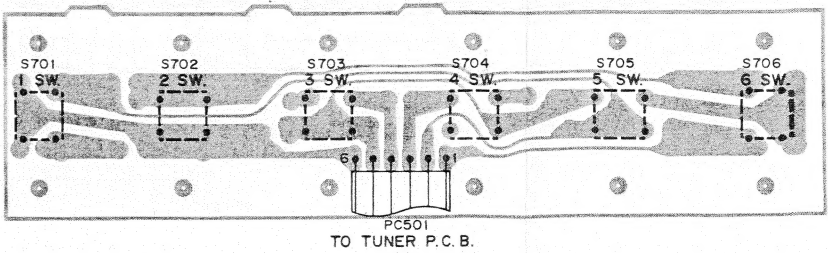
TUNER PRINTED CIRCUIT BOARD
(BOTTOM VIEW)



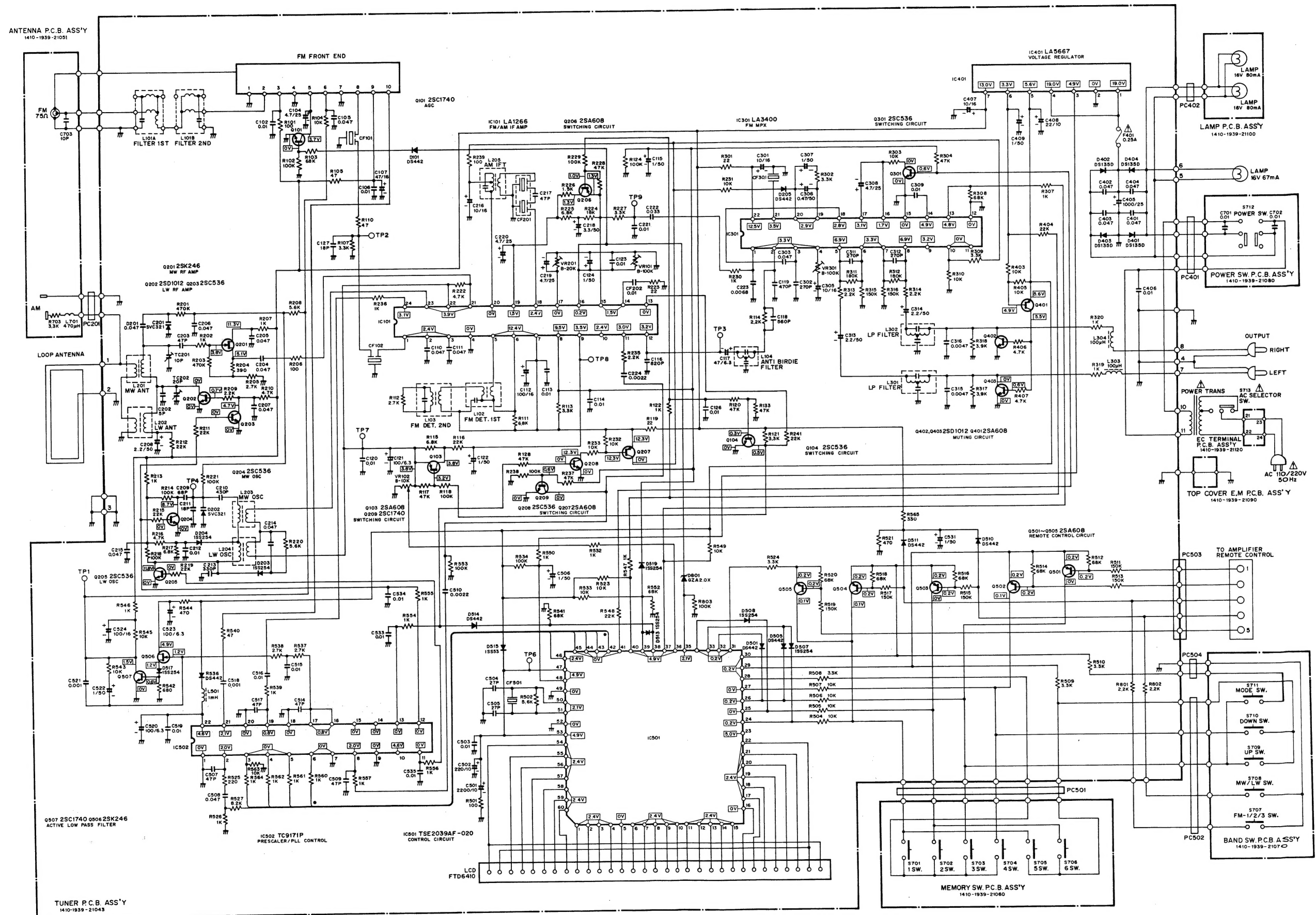
POWER SWITCH P.C.BOARD
(BOTTOM VIEW)



MEMORY SWITCH P.C.BOARD
(BOTTOM VIEW)

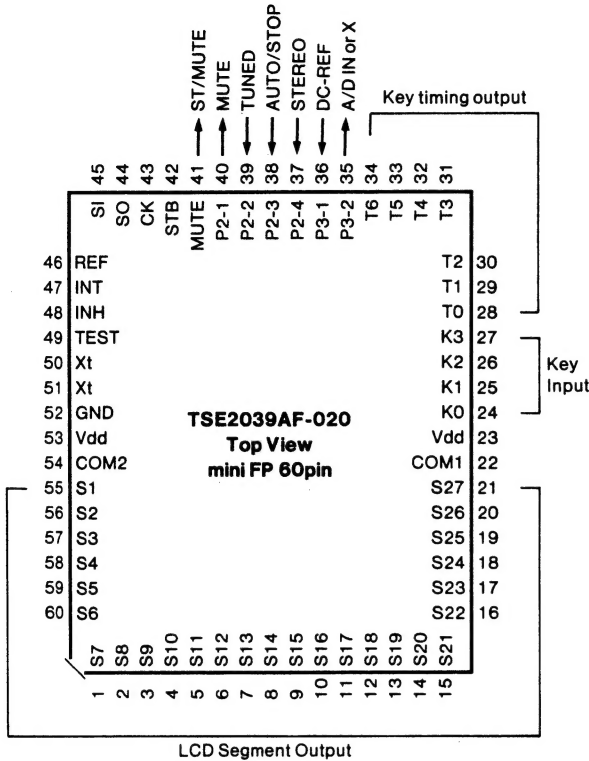


SCHEMATIC DIAGRAM



CPU PORT DESIGNATIONS (TSE 2039AF-020)

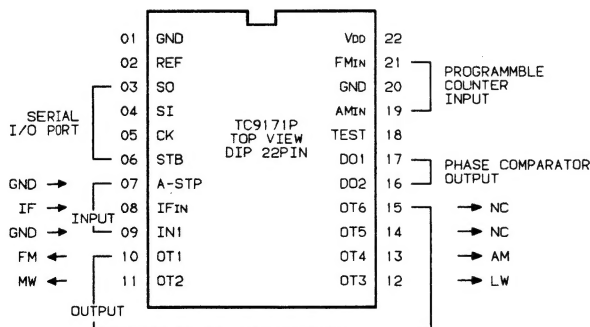
TSE 2039AF-020 OUTLINE



Port	Pin No.	Segment Name		Explanation of Function
		COM1	COM2	
COM1	22	COM1	—	Common 1
S27	21	AM	FM1	AM : MW (2 band) FM1 : FM1 band
S26	20	MW	FM2	MW : MW band FM2 : FM2 band
S25	19	LW	FM3	LW : LW band FM3 : FM3 band
S24	18	AUTO	MANUAL	AUTO : Auto Scan MANUAL : Manual Scan
S23	17	CH	1bc	CH : 6 CH 1bc : 108.00MHz segment
S22	16	[5]	STEREO	[5] : point 5 on level meter STEREO : Stereo In
S21	15	TUNED	MUTING	TUNED : Input On MUTING : Stereo/Mute On
S20	14	2f	2b	2f-a : 108.00MHz segment
S19	13	2e	2g	
S18	12	2d	2c	
S17	11	—	2a	
S16	10	3f	3b	3f-a : 108.00MHz segment
S15	9	3e	3g	
S14	8	3d	3c	
S13	7	FM dot	3a	: 108.00MHz mark
S12	6	4f	4b	4f-a : 108.00MHz segment
S11	5	4e	4g	
S10	4	4d	4c	
S9	3	[1]	4a	[1] : point 1 on level meter (normally ON)
S8	2	5g	5be	5g-f : 108.00MHz segment, 0/5
S7	1	5acdf	[2]	[2] : point 2 on level meter
S6	60	[3]	kHz	[3] : point 3 on level meter kHz : MW/LW unit
S5	59	[4]	MHz	[4] : point 4 on level meter MHz : FM unit
S4	58	7f	7b	7f-a : 6 CH segment
S3	57	7e	7g	
S2	56	7d	7c	
S1	55	MEMORY	7a	MEMORY : Store mode
COM2	54	—	COM2	Common 2

Port	Pin No.	Name	Assignment	Active	Initial
MUTE	41	ST/MUTE	Stereo/Mute Output	L	L
P2-1	40	MUTE	Mute Output	L	H
P2-2	39	TUNED	Tuned Input	L	—
P2-3	38	AUTO/STOP	Auto/Stop Input	L	—
P2-4	37	STEREO	Stereo Ind. Input	L	—
P3-1	36	DC-REF	A/D Ref Input	—	—
P3-2	35	A/D IN or X	Signal Meter Input	—	—
			Function Output	H	L

TC 9171P OUTLINE



Port	Pin No.	Name	Assignment	Active	Initial
A-Stop	07	GND	Non Use Input	—	L
IF-IN	08	IF-IN	IF Input	—	—
IN1	09	GND	Non Use Input	—	L
OT1	10	FM	Band Output	H	H
OT2	11	MW	Band Output	H	L
OT3	12	LW	Band Output	H	L
OT4	13	AM	Band Output	H	L
OT5	14	NC	Non Use Output	—	L
OT6	15	NC	Non Use Output	—	L

NOTES:

- All resistors values are indicated in "ohm" ($K=10^3$, $M=10^6$).
- All capacitors values are indicated in " μF " ($P=10^{-12}$).
- All voltages indicated on the schematics are measured under the following conditions.

a. Use a V.T.V.M.

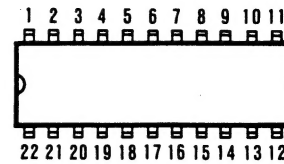
Because Fisher products are subject to continuous improvement, Fisher Corporation reserves the right to make any changes or modifications without notice.

- All voltages $\pm 10\%$ with respect to chassis ground
- No signals at input terminals
- AC input at 220 volts 50 Hz
- This is a basic schematic diagram.

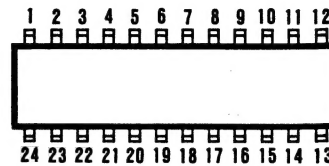
SEMICONDUCTOR LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW
2SA 608 2SC 536 2SC 1740		
2SK 246		
2SD 1012		
TERMINAL NAME		
B → BASE C → COLLECTOR E → EMITTER S → SOURCE G → GATE D → DRAIN		

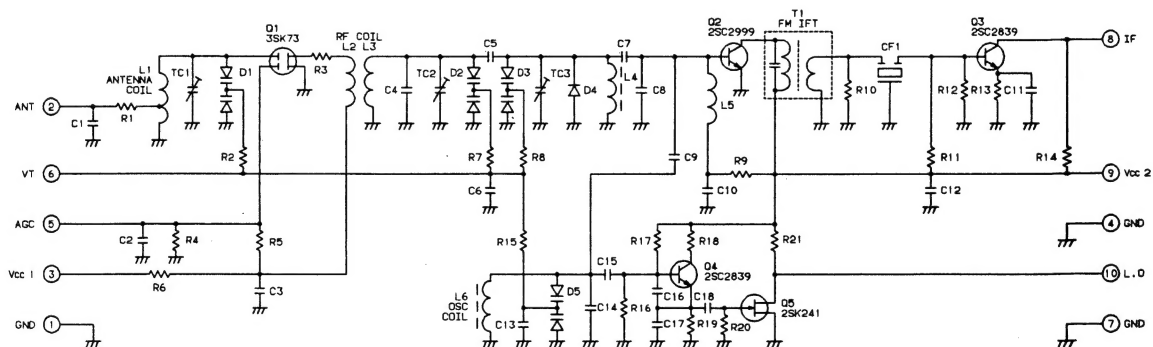
TC 9171 P/LA 3400 BOTTOM VIEWS



LA 1266 BOTTOM VIEW



FRONT END SCHEMATIC DIAGRAM



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